

# PATENT COOPERATION TREATY

WO 00/78555  
PCT/KR00/00485

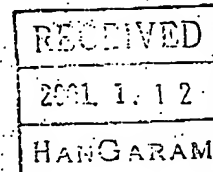
PCT

## NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:  
JUNG, Hyun-Young  
3rd floor  
Namsung B/D  
1474-12, Silim 11-dong  
Kwanak-gu  
Seoul 151-021  
RÉPUBLIQUE DE CORÉE



Date of mailing (day/month/year) 28 December 2000 (28.12.00)		
Applicant's or agent's file reference		
<b>IMPORTANT NOTICE</b>		
International application No. PCT/KR00/00485	International filing date (day/month/year) 18 May 2000 (18.05.00)	Priority date (day/month/year) 18 June 1999 (18.06.99)
Applicant DASAN C. & I. CO., LTD. et al.		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AU,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

CA,CN,EP,JP

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 28 December 2000 (28.12.00) under No. WO 00/78555.

### REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

### REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY  
**PCT**

REC'D 22 OCT 2001

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. <b>PCT/KR00/00485</b>	International filing date (day/month/year) 18 MAY 2000 (18.05.2000)	Priority date (day/month/year) 18 JUNE 1999 (18.06.1999)
International Patent Classification (IPC) or national classification and IPC  <b>IPC7 B42C 19/00</b>		
Applicant  DASON C & I CO., LTD. et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.  <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand  18 JANUARY 2001 (18.01.2001)	Date of completion of this report  09 OCTOBER 2001 (09.10.2001)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office Government Complex-Daejeon, Dunsan-dong, Seo-gu, Daejeon Metropolitan City 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  JIN, Yong Seok  Telephone No. 82-42-481-5519 

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR00/00485

## 1. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:  
pages 1-12 , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages 13-14 , as originally filed  
pages NONE , as amended (together with any statement) under Article 19  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages 1/3-3/3 , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_ , as originally filed  
pages \_\_\_\_\_ , filed with the demand  
pages \_\_\_\_\_ , filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide** and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheet NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR00/00485

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-3	YES
	Claims		NO
Inventive step (IS)	Claims	1-3	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-3	YES
	Claims		NO

### 2. Citations and explanations (Rule 70.7)

Claims 1-3 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest that the claimed apparatus provides an automatic paper turning-over device which scans and treats image information of the sheet and obtains a desired image from the treated image information. The claimed auto sheet-turning over device is comprised of a transparent member consisting of a transparent material, a lifting means for the bound document, a pressing means having a pressing piece for pushing up the opposite sides of the binding portion, a sheet-turning over means having a sheet-lifting section mounted to lift the scanned out sheet, a controller for controlling a series of lifting and pressing, a balance weight mounted on both sides of the supporting member, and a suction portion for sucking the sheet using a vacuum force.

The bookbinding machines disclosed by documents D1 (JP61-93270 U), D2 (JP06-20061 U), D3 (US4569620 A), D4 (US3902210 A) and D5(KR1996-520 A) cited in the International Search Report as prior art, represent the state of the art. D1 shows a bookbinding machine in clamping the sheets, conveying between the operations, and applying an adhesive to a stack of sheets. D2 shows a bookbinding machine having a multi-clamp means to be selected and then stopped in the conveying process, and a reoperating means on the conveying. D3 shows a book turn-around and stack accumulator apparatus for turning over alternate books fed by a conveyor from a building-in machine that leads to a stacking device. D4 shows a binding machine for papers wherein mechanical binding elements are first put into place and pressed together to engage ratchet teeth, and second locked together. D5 shows a binding machine for folding the stacks of the sheets, applying adhesive to stacks of sheets, pressing the stacks and then cutting the stacks for the selected size.

Neither of these documents show an image scanning device such as a scanner or an auto duplicator and the like, which turns over a sheet of a bound document automatically to scan an image. Accordingly, the knowledge found in these documents does not apply individually or in combination to create a bookbinding machine according to the invention claims.

Therefore, the claimed invention referred to in claims 1-3 is novel and inventive. It is also considered to be industrially applicable.

RECORD COPY

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REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only	
PCT/KR 00/00485	
International Application No.	
18 May 2000 (if .cf.)	
International Filing Date	
Korean Industrial Property Office	
P C T International Application	
Name of receiving Office and "PCT International Application"	
Applicant's or agent's file reference	
(if desired) (12 characters maximum)	

<b>Box No. I TITLE OF INVENTION</b>	
AUTOMATIC PAGE TURNING-OVER APPARATUS FOR BOUND PAPERS	
<b>Box No. II APPLICANT</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
DASAN C & I CO., LTD.	
5Fl.,MSAB/D, 891-43 Daechi-dong, Kangnam-gu,	
Seoul, 135-280, Republic of Korea	
<input type="checkbox"/> This person is also inventor.	
Telephone No.	
82-2-561-4697	
Facsimile No.	
82-2-561-4696	
Teleprinter No.	
State (that is, country) of nationality: KR	
State (that is, country) of residence: KR	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<b>Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
HA, Young-Kyun	
8-121 Yejang-dong, Joong-gu,	
Seoul, 100-250, Republic of Korea	
This person is:	
<input type="checkbox"/> applicant only	
<input checked="" type="checkbox"/> applicant and inventor	
<input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)	
State (that is, country) of nationality: KR	
State (that is, country) of residence: KR	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
<b>Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE</b>	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
JUNG, Hyun-Young	
3rd Fl., Namsung B/D., 1474-12,	
Silim 11-dong, Kwanak-gu, Seoul,	
151-021, Republic of Korea	
Telephone No.	
82-2-569-0223	
Facsimile No.	
82-2-569-2938	
Teleprinter No.	
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☐ **AP** ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ **EA** Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA** OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |  |  |
|--|--|
| <input type="checkbox"/> <b>AL</b> Albania .....                               | <input type="checkbox"/> <b>LS</b> Lesotho .....                                   |
| <input type="checkbox"/> <b>AM</b> Armenia .....                               | <input type="checkbox"/> <b>LT</b> Lithuania .....                                 |
| <input type="checkbox"/> <b>AT</b> Austria .....                               | <input type="checkbox"/> <b>LU</b> Luxembourg .....                                |
| <input checked="" type="checkbox"/> <b>AU</b> Australia .....                  | <input type="checkbox"/> <b>LV</b> Latvia .....                                    |
| <input type="checkbox"/> <b>AZ</b> Azerbaijan .....                            | <input type="checkbox"/> <b>MD</b> Republic of Moldova .....                       |
| <input type="checkbox"/> <b>BA</b> Bosnia and Herzegovina .....                | <input type="checkbox"/> <b>MG</b> Madagascar .....                                |
| <input type="checkbox"/> <b>BB</b> Barbados .....                              | <input type="checkbox"/> <b>MK</b> The former Yugoslav Republic of Macedonia ..... |
| <input type="checkbox"/> <b>BG</b> Bulgaria .....                              | <input type="checkbox"/> <b>MN</b> Mongolia .....                                  |
| <input type="checkbox"/> <b>BR</b> Brazil .....                                | <input type="checkbox"/> <b>MW</b> Malawi .....                                    |
| <input type="checkbox"/> <b>BY</b> Belarus .....                               | <input type="checkbox"/> <b>MX</b> Mexico .....                                    |
| <input checked="" type="checkbox"/> <b>CA</b> Canada .....                     | <input type="checkbox"/> <b>NO</b> Norway .....                                    |
| <input type="checkbox"/> <b>CH and LI</b> Switzerland and Liechtenstein .....  | <input type="checkbox"/> <b>NZ</b> New Zealand .....                               |
| <input checked="" type="checkbox"/> <b>CN</b> China .....                      | <input type="checkbox"/> <b>PL</b> Poland .....                                    |
| <input type="checkbox"/> <b>CU</b> Cuba .....                                  | <input type="checkbox"/> <b>PT</b> Portugal .....                                  |
| <input type="checkbox"/> <b>CZ</b> Czech Republic .....                        | <input type="checkbox"/> <b>RO</b> Romania .....                                   |
| <input type="checkbox"/> <b>DE</b> Germany .....                               | <input type="checkbox"/> <b>RU</b> Russian Federation .....                        |
| <input type="checkbox"/> <b>DK</b> Denmark .....                               | <input type="checkbox"/> <b>SD</b> Sudan .....                                     |
| <input type="checkbox"/> <b>EE</b> Estonia .....                               | <input type="checkbox"/> <b>SE</b> Sweden .....                                    |
| <input type="checkbox"/> <b>ES</b> Spain .....                                 | <input type="checkbox"/> <b>SG</b> Singapore .....                                 |
| <input type="checkbox"/> <b>FI</b> Finland .....                               | <input type="checkbox"/> <b>SI</b> Slovenia .....                                  |
| <input type="checkbox"/> <b>GB</b> United Kingdom .....                        | <input type="checkbox"/> <b>SK</b> Slovakia .....                                  |
| <input type="checkbox"/> <b>GD</b> Grenada .....                               | <input type="checkbox"/> <b>SL</b> Sierra Leone .....                              |
| <input type="checkbox"/> <b>GE</b> Georgia .....                               | <input type="checkbox"/> <b>TJ</b> Tajikistan .....                                |
| <input type="checkbox"/> <b>GH</b> Ghana .....                                 | <input type="checkbox"/> <b>TM</b> Turkmenistan .....                              |
| <input type="checkbox"/> <b>GM</b> Gambia .....                                | <input type="checkbox"/> <b>TR</b> Turkey .....                                    |
| <input type="checkbox"/> <b>HR</b> Croatia .....                               | <input type="checkbox"/> <b>TT</b> Trinidad and Tobago .....                       |
| <input type="checkbox"/> <b>HU</b> Hungary .....                               | <input type="checkbox"/> <b>UA</b> Ukraine .....                                   |
| <input type="checkbox"/> <b>ID</b> Indonesia .....                             | <input type="checkbox"/> <b>UG</b> Uganda .....                                    |
| <input type="checkbox"/> <b>IL</b> Israel .....                                | <input checked="" type="checkbox"/> <b>US</b> United States of America .....       |
| <input type="checkbox"/> <b>IN</b> India .....                                 | <input type="checkbox"/> <b>UZ</b> Uzbekistan .....                                |
| <input type="checkbox"/> <b>IS</b> Iceland .....                               | <input type="checkbox"/> <b>VN</b> Viet Nam .....                                  |
| <input checked="" type="checkbox"/> <b>JP</b> Japan .....                      | <input type="checkbox"/> <b>YU</b> Yugoslavia .....                                |
| <input type="checkbox"/> <b>KE</b> Kenya .....                                 | <input type="checkbox"/> <b>ZW</b> Zimbabwe .....                                  |
| <input type="checkbox"/> <b>KG</b> Kyrgyzstan .....                            |  |
| <input type="checkbox"/> <b>KP</b> Democratic People's Republic of Korea ..... |  |
| <input type="checkbox"/> <b>KR</b> Republic of Korea .....                     |  |
| <input type="checkbox"/> <b>KZ</b> Kazakhstan .....                            |  |
| <input type="checkbox"/> <b>LC</b> Saint Lucia .....                           |  |
| <input type="checkbox"/> <b>LK</b> Sri Lanka .....                             |  |
| <input type="checkbox"/> <b>LR</b> Liberia .....                               |  |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Sheet No. ...3...


Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) 18.06.1999 (18, JUNE, 1999)	1999-022993			
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY			
<b>Choice of International Searching Authority (ISA)</b> (If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):  ISA: / KR	<b>Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):</b>  Date (day/month/year)      Number      Country (or regional Office)		

Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request : 3 description (excluding sequence listing part) : 10 claims : 2 abstract : 1 drawings : 3 sequence listing part of description : Total number of sheets : 19	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):
Figure of the drawings which should accompany the abstract: 6	Language of filing of the international application: Korean

Box No. IX SIGNATURE OF APPLICANT OR AGENT	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).  <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 40%;">JUNG, Hyun-Young</div> <div style="width: 10%; text-align: center;">  </div> <div style="width: 50%;"></div> </div>	

For receiving Office use only		2. Drawings:  <input checked="" type="checkbox"/> received:  <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	18 May 2000 (18.05.00)	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA / KR	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	06 JUNE 2000 (06.06.00)

Fig. 1

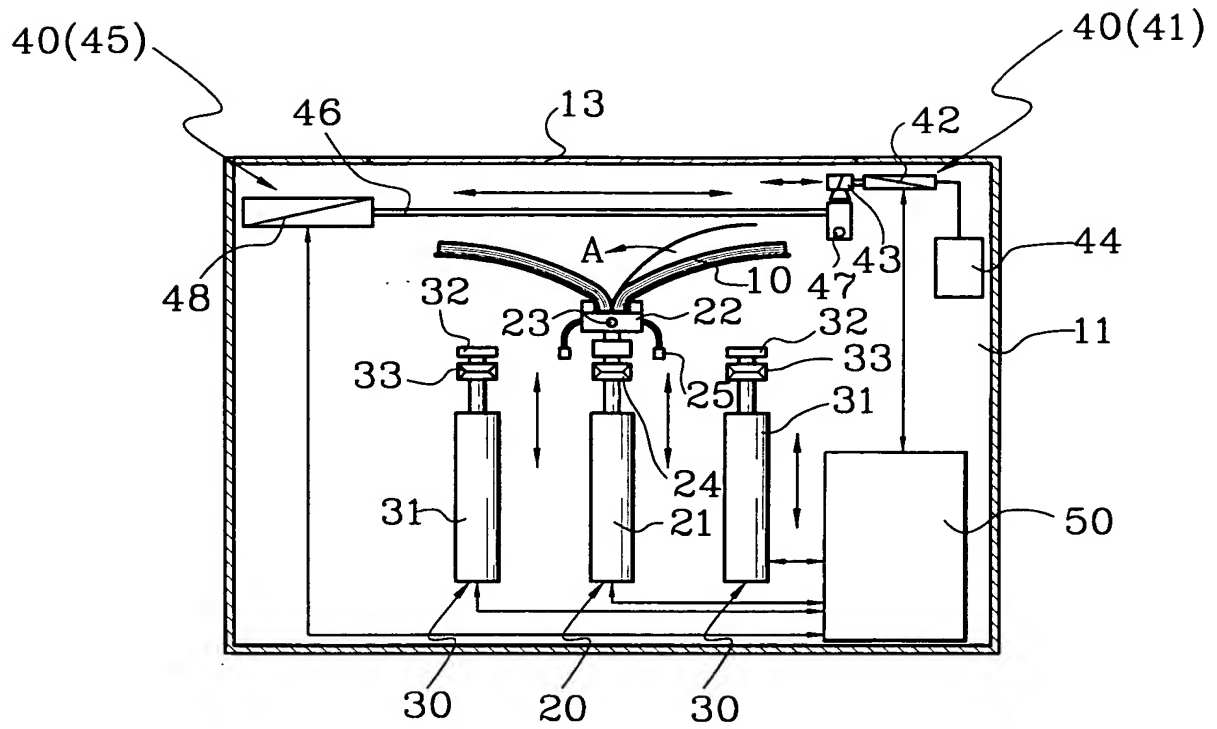


Fig. 2

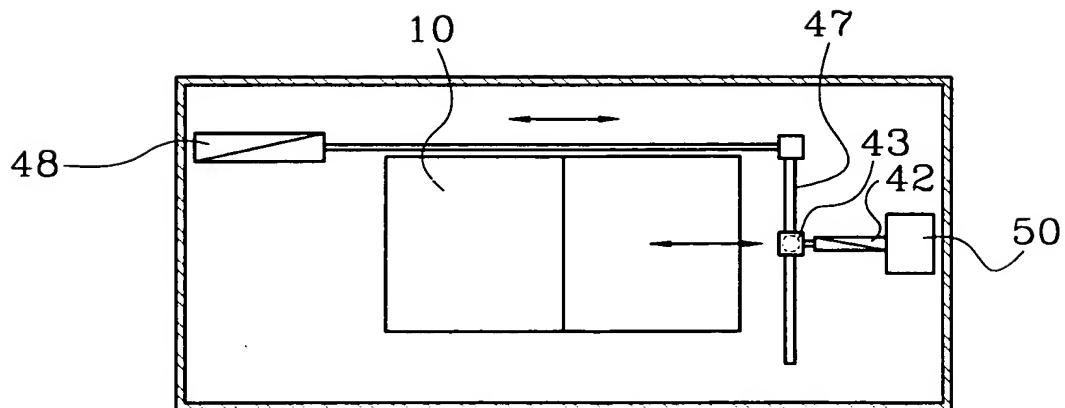




Fig. 3

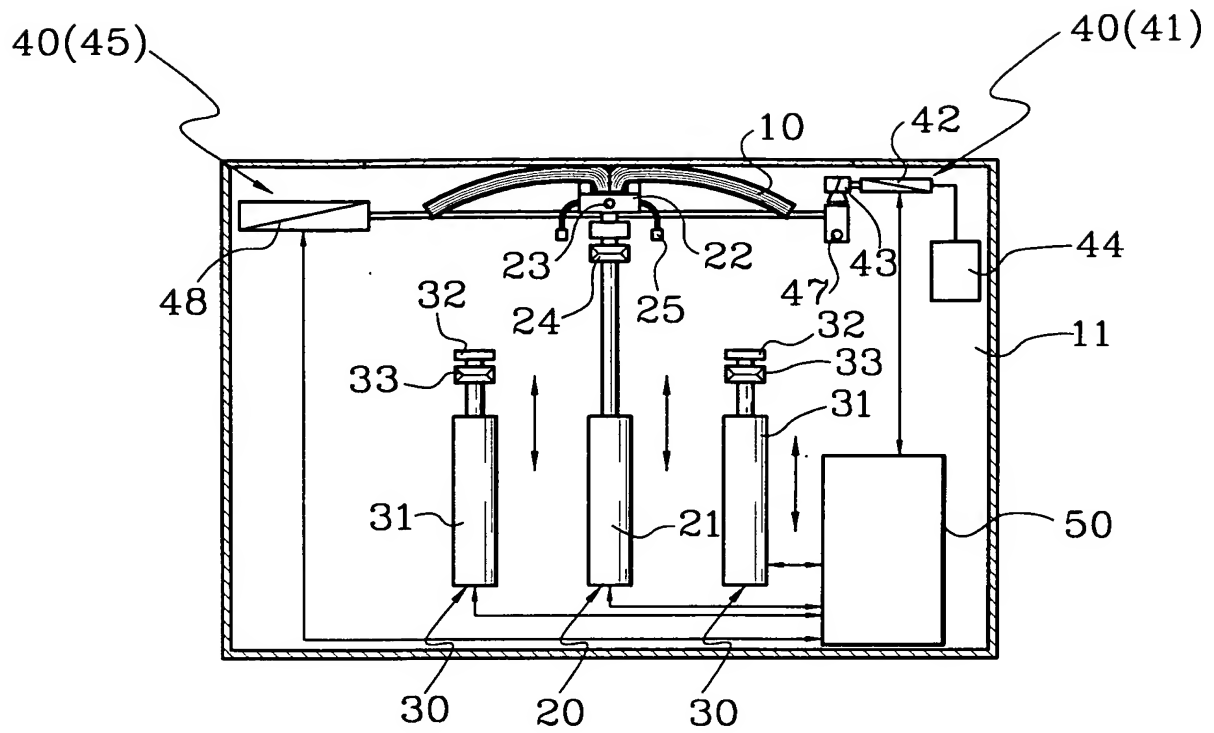


Fig. 4

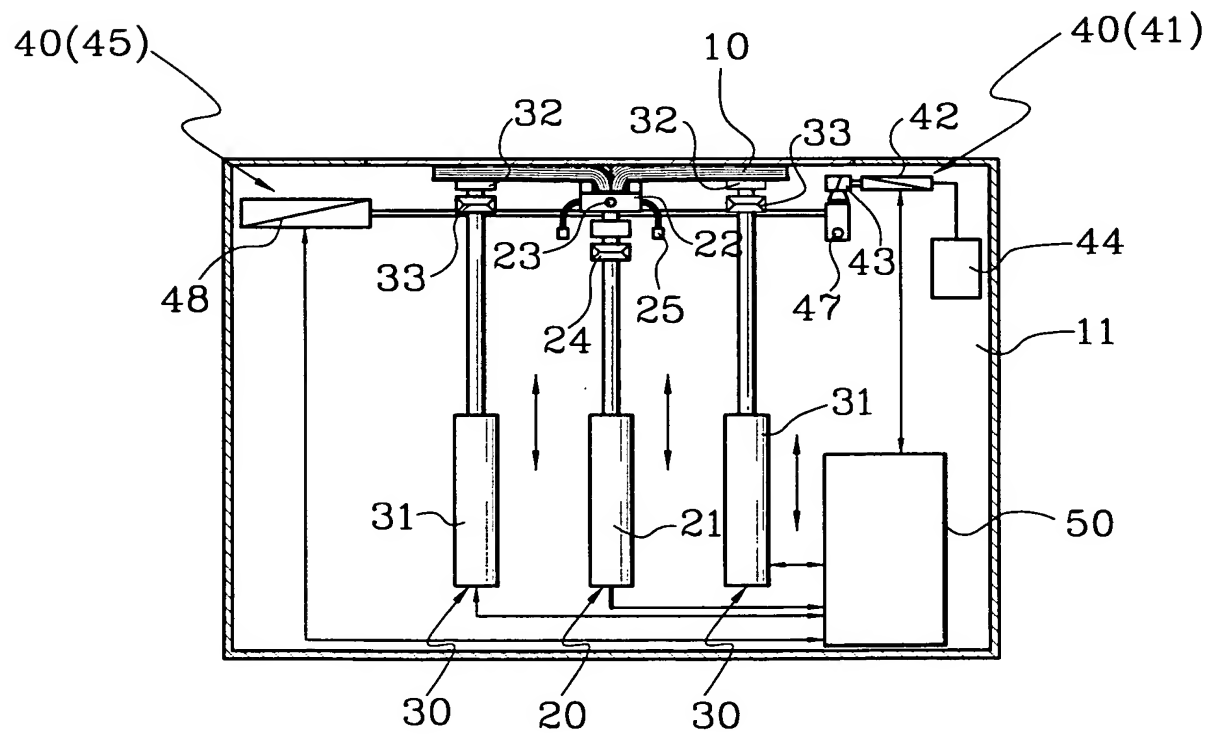


Fig. 5

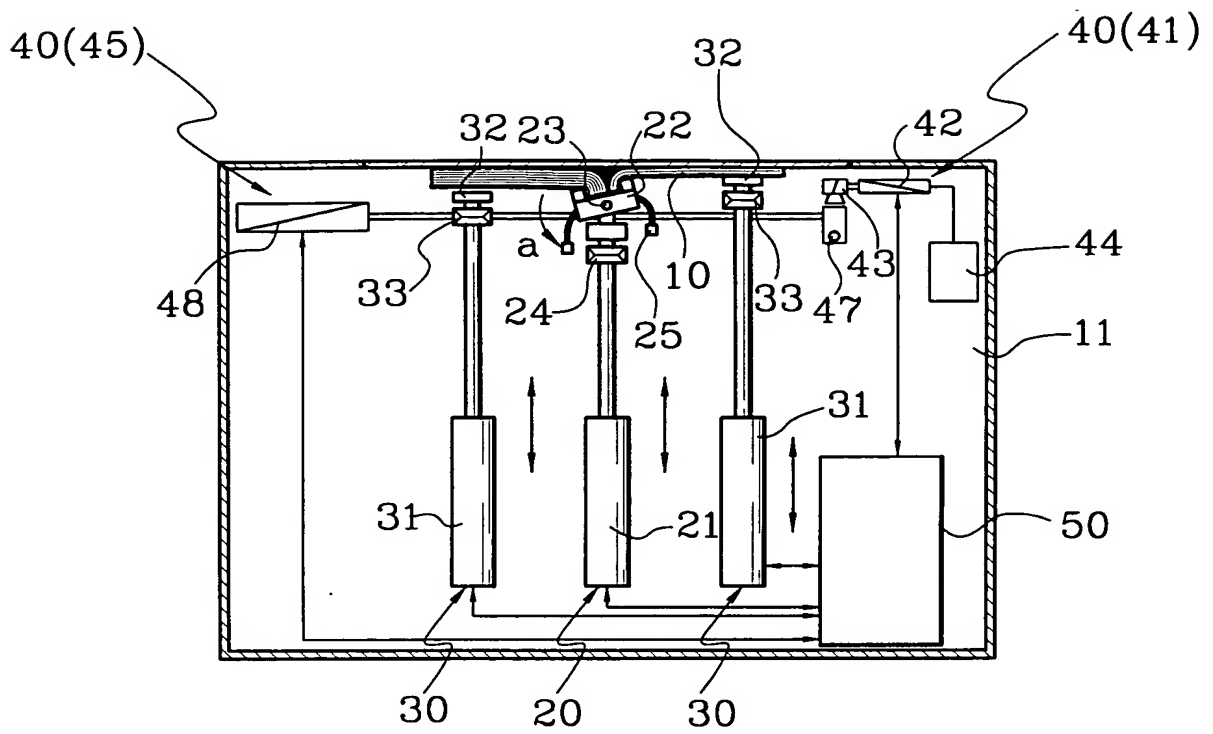
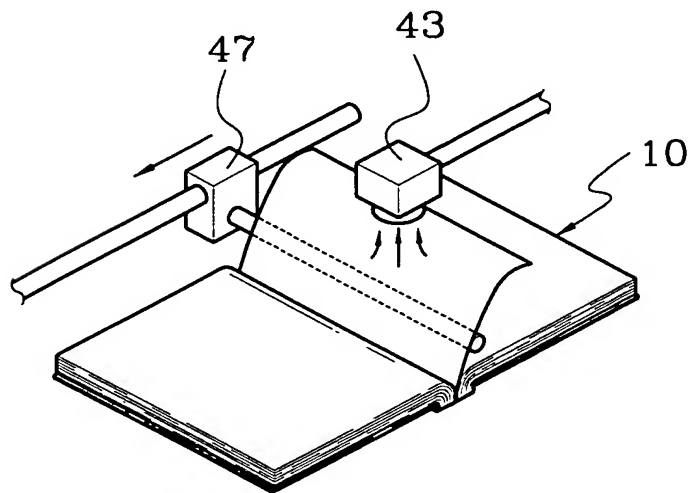


Fig. 6



## 제본문서 용지 자동넘김장치

### 발명의 배경

#### 1. 발명의 분야

본 발명은 스캐너, 자동 복사기기 등을 포함하는 화상촬상장치에 적용되는 것으로 제본되어 있는 문서용지를 자동으로 넘겨 촬상되도록 하는 제본문서 용지 자동넘김장치에 관한 것이다.

#### 2. 관련분야의 설명

일반적으로, 스캐너 또는 자동 복사기기 등과 같은 화상촬상장치는 화상정보를 취득하기 위한 화상촬상부, 상기 화상촬상부를 구동시키기 위한 구동부, 촬상된 화상정보의 처리를 수행하는 화상처리부, 상기 각부를 제어하는 마이크로 프로세서 등을 포함하는 제어회로부 및 상기 화상정보를 출력하기 위한 구동기구로 구성되어 있다.

이러한 종래의 화상촬상장치는 모두 한 장의 용지에 대해서만 촬상이 가능한 기술로서, 촬상시에는 유리판 위에 용지를 얹어놓은 다음 촬상키이를 눌러서 해당면의 화상을 촬상하고, 다음 용지에 대해서도 위와 같은 작업을 반복함으로써 화상 촬상이 이루어지게 한다. 이와 더불어, 책과 같은 형태로 제본되어 있거나, 바인더 등에 의해 용지의 한면이 서로 붙어 있는 형태의 문서를 촬상하기 위해서는 한면을 뒤집어 촬상하고, 다음면을 촬상하기 위해서 또 다시 뒤집는 작업을 수행함으로써, 예컨데, 50장 이상의 문서를 촬상하기 위해서는 50번 이상의 반복작업을 해야만 촬

상작업을 끝낼 수 있게 된다. 여기서도 문서를 뒤집고 넘기는 일과 함께 활상기도 함께 눌러져야 한다.

이와 같이, 종래의 화상활상장치는 낱장 활상이 이루어지기 때문에 제본문서를 한면씩 넘기면서 활상조작을 반복해야 하는 불편함이 있다. 또한, 상기 절차를 계속 반복해야 하기 때문에 작업자의 피로감은 물론 작업의 정확도와 활상속도가 떨어짐으로써, 결과적으로는 활상작업 효율이 떨어지는 문제점이 있다.

## 발명의 개요

본 발명은 상기와 같은 문제점을 개선하고자 창출된 것으로서, 제본문서를 한 장씩 자동으로 넘기면서 활상을 수행하는 수단을 구비함으로써, 제본문서를 일일이 손으로 넘기면서 화상활상을 수행하던 불편함을 해소하고, 작업의 정확도와 활상속도를 증가시켜 제본문서의 활상작업에 편리함을 확보할 수 있도록 화상활상장치에 적용되는 제본문서 용지 자동넘김장치를 제공하는 점에 그 목적이 있다.

상기와 같은 목적을 달성하기 위하여 본 발명에 따른 제본문서 용지 자동넘김장치는 용지의 화상정보를 활상하여 처리하고, 그 처리된 화상정보를 원하는 화상으로 얻는 화상활상기기에 적용되는 제본문서 용지 자동넘김장치를 구비함에 있어서, 유리판 등의 투명재질로 구성된 투명부재와; 상기 투명부재에 대향되는 방향으로 펼쳐진 제본문서의 제본부를 맞물어 실린더부에 의해 수직승강되며 피봇부재를 중심으로 소정각도 회동가능한 받침부재와, 상기 받침부재의 하단에 설치되어 상기 투명부재로의 가압력을 완충하는 탄성편을 구비하는 제본문서 승강수단과; 상기 제본문서의 활상면이 상기 투명부재에 완전밀착될 수 있게 상기 제본문서의 제본부

양측부를 밀어돌리도록 승강하는 가압편과, 상기 가압편과 동축으로 장착된 탄성편 및 상기 가압편과 탄성편을 승강시키는 실린더부로 구성된 가압수단과; 활상이 완료된 용지를 제본문서의 중심방향으로 들어올리도록 설치되는 용지올림부와, 상기 용지올림부에 의해 형성된 공간에서 넘김바아를 좌우 왕복운동시켜 상기 용지를 넘겨주는 용지넘김부를 포함하는 용지넘김수단; 및 상기 제본문서의 승강, 가압 및 용지넘김의 일련과정을 제어하는 제어부;를 포함하여 구비되는 것을 특징으로 한다.

상기 받침부재의 양측에 무게추가 장착되어 있어 상기 받침부재의 회동을 촉진시키는 것이 바람직하고, 상기 용지올림부는 진공력 또는 정전기력에 의해 상기 용지를 흡인하여 들어올리는 흡인부 또는 상기 용지와 외주와의 마찰에 의해 상기 용지를 들어올리는 롤러부 중 어느 하나가 구비되어 있는 것이 바람직하다.

따라서, 본 발명에 따른 제본문서 용지 자동 넘김장치는 스캐너, 복사기기 등을 포함하는 화상촬상장치에 적용가능하며, 작업자가 일일이 수작업으로 제본문서를 넘겨가면서 활상을 수행하던 종래와는 달리, 활상작업이 편리해지고, 제본문서를 자동으로 넘기면서 해당면의 활상이 이루어지기 때문에 화상촬상에 소요되는 시간을 단축할 수 있는 것은 물론 작업의 정확도와 활상속도가 증가되어 활상작업 효율의 상승 및 소요인력이 절감되는 점에 그 특징이 있다.

## 도면의 간단한 설명

도 1은 본 발명에 따른 제본문서 용지 자동넘김장치를 나타내 보인 정면도이고,

도 2는 도 1의 평면도를 나타내 보인 도면이고,  
 도 3은 도 1의 제본문서 승강수단의 동작상태를 나타내 보인 개략적 도면이  
 고,  
 도 4는 도 1의 가압수단의 동작상태를 나타내 보인 개략적 도면이고,  
 도 5는 도 3의 다른 동작상태를 나타내 보인 도면이고,  
 그리고 도 6은 도 1의 용지넘김수단의 동작상태를 나타내 보인 개략적 도면  
 이다.

#### 양호한 실시예의 상세한 설명

이러한 특징을 가진 본 발명에 따른 제본문서 용지 자동넘김장치를 첨부된  
 도면을 참조하여 상세하게 설명한다.

도 1 및 도 2에 도시된 바와 같이, 본 발명에 따른 제본문서 용지 자동넘김  
 장치는 스캐너 또는 복사기기 등의 화상촬상장치에 적용되는 것으로 상면에 유리판  
 등의 투명재질로 된 투명부재(13)가 마련되어 있는 하우징(11)과, 상기 하우징(11)  
 전면에서 개폐가능한 도어부(미도시)를 가진다. 그리고, 상기 하우징(11)의 내부에  
 본 발명을 특징짓는 제본문서 승강수단(20), 가압수단(30), 용지넘김수단(40) 및 제  
 부(50)가 마련된다.

즉, 상기 투명부재(13)에 대향되는 방향으로 제본문서(10)를 떠받친 상태에  
 서 상기 제본문서(10)의 촬상면 중앙부가 투명부재(13)에 밀착되도록 수직승강되는  
 제본문서 승강수단(20)을 구비하고, 상기 제본문서(10)의 촬상면 전체가 투명부재  
 (13)에 확장 밀착될 수 있게 상기 제본문서(10)의 양면을 떠 받쳐 투명부재(13)에

밀착되도록 하는 가압수단(30)을 구비하며, 활상이 완료된 용지를 들어올려 넘겨주는 용지넘김수단(40)을 구비하고, 상기 제본문서 승강수단(20), 가압수단(30) 및 용지넘김수단(40)에 각각 연결되어 상기의 각 수단에 설치된 감지수단(미도시)의 신호를 전달받아 다시 제어신호를 각각의 수단에 제공하여 구동을 제어하기 위한 제어부(50)를 구비한다.

상기 제본문서 승강수단(20)은 실린더부(21)와, 실린더부(21)에 의해 구동되 실린더로드의 상단에 장착되고 펼쳐진 제본문서(10)의 제본부가 안치되는 받침부재(22)를 구비한다. 또한, 상기 받침부재(22)의 중심축에는 받침부재(22)의 몸체가 소 각도 회동가능하게 하여 상기 제본문서(10)의 중앙부가 투명부재(13)에 확장밀착되도록 지지하는 피봇부재(23)가 설치되어 있다. 즉, 상기 받침부재(22)는 피봇부재(23) 중심으로 좌우회동이 가능하게 되고, 제본문서(10)가 제본부를 중심으로 비대칭상황이 되어도 상기 제본부를 투명부재(13)에 밀어줌으로써, 제본문서(10)의 중앙부가 투명부재(13)에 확장밀착되도록 한다. 이와 함께, 상기 받침부재(22)의 하측에는 상 실린더로드와, 상기 실린더로드의 동측상에 설치되어 투명부재(13)에 밀착되는 제본문서(10)의 가압력을 완충함으로써 투명부재(13)가 파손되지 않도록 되어 있는 탄성편(24)이 마련된다. 또한, 상기 받침부재(22)의 양측에는 무게추(25)가 장착된다. 예컨데, 제본문서(10)의 앞부분이나 뒷부분을 투명부재(13)에 밀착시킬 때는 상기 받침부재(22)가 거의 90° 가까이 회동해야만 활상면이 투명부재(13)에 완벽히 밀착하게 되므로 상기 무게추(25)는 이 때에 받침부재(22)의 회동을 더욱 촉진시키는 기능을 한다.

상기 가압수단(30)은 제본문서(10)의 활상면이 상기 투명부재(13)에 완전밀

될 수 있게 제본문서(10)의 양면을 받침과 동시에 가압하는 가압편(32)이 설치되고, 상기 가압편(32)은 실린더로드에 지지되어 실린더부(31)에 의해 수직승강된다. 또한, 상기 실린더로드의 동축상에는 제본문서(10)의 양측에 가해지는 가압력을 완충함으로써 가압편(32)의 가압력에 의해 투명부재(13)가 파손되지 않도록 되어 있는 탄성편(33)이 마련된다.

상기 용지넘김수단(40)은 활상이 완료된 용지를 화살표(A) 방향으로 넘기기 위해 용지를 들어올리는 용지올림부(41)가 구비되어 있고, 상기 용지올림부(41)에 의해 올려진 용지를 넘겨준 뒤 원위치로 복귀되는 용지넘김부(45)를 포함한다.

상기 용지올림부(41)는 실린더부(42)에 의해 직선왕복운동이 가능하게 설치된다. 또한, 본 발명에서의 상기 용지올림부(41)는 진공력 또는 정전기력에 의해 상기 용지를 흡인하여 들어올리는 흡인부(43)와 상기 흡인부(43)와 연결되는 흡인발생부(44)가 설치되어 있으나, 상기 용지를 마찰에 의해 들어올리도록 마찰기구 예컨대 롤러부(미도시)를 이용하는 것도 본 발명에 포함된다.

상기 용지넘김부(45)는 몸체가 레일봉(46)에 의해 지지되어 왕복운동하는 넘김바(47)를 가지고 있으며, 상기 넘김바(47)의 몸체는 구동부(48)에 의해 주행되는 기어벨트(미도시)에 지지되어 있어 기어벨트의 정역주행에 따라 왕복운동이 가능하게 된다.

상기 제어부(50)는 별도의 외부장치와 소정의 신호교환이 가능하도록 설치되어 상기 제본문서(10)의 승강수단(20), 가압수단(30) 및 용지넘김수단(40)을 제어한 즉, 상기 제어부(50)는 제본문서(10)가 투명부재(13) 쪽으로 상승되어 투명부재(13) 밀착되도록 제본문서 승강수단(20) 및 가압수단(30)의 구동을 제어하고, 용지의 활상



면이 활상완료된 후, 소정신호를 전달받아 상기 제본문서 승강수단(20) 및 가압수단(30)이 하강되도록 제어한다. 그리고, 제본문서(10)가 하강된 상태에서 용지넘김수단(40)이 구동되어 용지가 넘겨지도록 한 다음, 승강수단(20) 및 가압수단(30)이 투명부재(13)로 다시 상승되도록 제어한다. 또한, 상기 제어부(50)는 승강수단(20) 및 가압수단(30)의 탄성편(24, 33)에 가해지는 압착력을 검출한 신호를 전달받아 각각의 제본문서 승강수단(20) 및 가압수단(30)에 적정의 가압력으로 제본문서(10)를 가압할 수 있게 제어한다. 이와 함께, 상기 제어부(50)는 제본문서(10) 한 권의 활상이 완료될 때 활상할 용지가 더 이상 없다는 신호를 전달받아 상기 제본문서(10)가 원래위치로 하강될 수 있게 상기 승강수단(20) 및 가압수단(30)을 제어하여 활상 작업을 종료되도록 한다.

이하, 상기한 바와 같이 구성된 제본문서 용지 자동넘김장치 동작 및 작용을 상세하게 설명하기로 한다.

먼저, 도 1에 도시된 바와 같이, 초기 활상이 시작될 용지의 활상면이 보이도록 제본문서(10)를 펼친 채, 제본부가 받침부재(22)에 안치되도록 올려놓아 투명부재(13)와 제본문서(10)의 활상할 면이 서로 대향되게 한다. 이 때에, 상기 받침부재(22) 양측에 소정의 자중을 가지는 무게추(25)가 설치되어 있기 때문에, 전술한 바와 같이, 제본문서(10) 맨 앞이나 마지막 페이지를 활상할 경우에도 활상면이 투명부재(13)에 완벽하게 밀착된다.

이 상태에서 활상키를 누르면, 도 3에 도시된 바와 같이, 제어부(50)는 승강수단(20)에 구동제어신호를 제공한다. 이 후, 받침부재(22)는 실린더부(21)의 구동로 실린더로드에 의해 지지된 채 상승되고, 받침부재(22)는 제본문서의 제본부를 적

정 가압력으로 밀어 제본문서(10)의 중앙부를 투명부재(13)에 완전밀착시킨다. 이 때에, 탄성편(24)은 제본문서(10)의 밀착에 따른 받침부재(22)의 가압력을 완충하게 된다. 이는 밀착되는 받침부재(22)의 가압력을 제한하여 완충시킴으로서 투명부재(13) 및 제본문서(10)가 파손되는 것을 방지하기 위함이다. 이와 더불어, 제어부(50)는 탄성편(24)의 압축력을 감지신호로 제공받아 제본문서(10)의 활상면이 기설정된 최적의 가압력으로 밀착되었을 때에 받침부재(22)의 상승이 정지되도록 제어한다. 이 상태에서의 제본문서(10) 중앙부는 투명부재(13)에 확장밀착된다.

이 후, 도 4에 도시된 바와 같이, 상기 제어부(50)는 가압수단(30)에 구동제 신호를 제공하게 되고, 가압편(32)은 구동되는 실린더부(31)의 실린더로드에 의해 상승되어 받침부재(22) 밖으로 쳐져 있는 제본문서(10)의 양면을 떠받친 상태에서 투명부재(13) 쪽으로 상승시킨다. 그러면, 용지의 활상면은 상기 가압편(32)에 의해 가되어 투명부재(13)에 밀착된다. 이 때에도 가압편(32)과 동축상으로 설치된 탄성편(33)은 제본문서(10) 양면의 밀착에 따른 가압편(32)의 가압력을 완충하게 된다. 이 밀착되는 가압편(32)의 가압력을 제한하여 완충시킴으로서 투명부재(13) 및 제본문서(10)가 파손되는 것을 방지하기 위함이다. 이와 더불어, 제어부(50)는 탄성편(33)의 압축력을 감지신호로 제공받아 제본문서(10)의 활상면이 기설정된 최적의 가압력으로 밀착되었을 때에 가압편(32)의 상승이 정지되도록 제어한다. 이 상태에서의 제본문서(10) 양면은 투명부재(13)에 완전밀착된다.

한편, 도 5에 도시된 바와 같이, 작업진행 중이나, 전반부의 용지 활상작업 또는 후반부의 용지 활상작업 중에 상기 제본문서(10)가 각기 다른 두께로 받침부재(22)에 펼쳐져 있으면 제본문서(10)의 제본부는 두께가 두꺼운 쪽으로 치우치게 된

다. 이와 동시에 상기 받침부재(22)는 제본문서(10)의 활상면이 투명부재(13)에 밀착될 때 치우치는 상기 제본부에 대응되게 피봇부재(23)를 중심으로 (a)방향으로 회동되어 기울지게 되고, 이러한 상태에서 받침부재(22)는 제본부를 가압밀착하게 된다. 그러면, 상기 제본문서(10)의 용지는 중앙부까지 펼쳐져 투명부재(13)에 완전밀착된다. 이러한 받침부재(22)의 회동은 무게추(25)에 의해 더욱 촉진되므로 제본문서(10)의 거의 앞이나 뒤를 투명부재(13)에 밀착시킬 때도 완벽하게 밀착된다.

이러한 동작이 완료되면, 소정의 화상촬상장치(미도시)는 제어신호에 의해 제본문서(10)의 활상면을 촬상하게 되고, 촬상된 활상면의 화상정보를 독취하여 처리한 다음 최종적으로 원하는 화상을 얻게 된다.

이 후, 상기의 화상취득이 완료되면, 제어부(50)는 승강수단을 제어하여 받침부재(22)를 하강시킨다. 이와 함께, 가압수단(30)의 가압편(32) 또한 하강시키고, 제어부(50)로부터 작업종료 판단여부에 따라 작업계속 명령이 전달되면 용지넘김수단(40)은 그 제어신호를 전달받아 구동된다.

즉, 도 6에 도시된 바와 같이, 원래의 위치로 하강된 제본문서(10)는 용지넘김수단(40)에 의해 자동적으로 용지가 넘겨지는데, 제어부(50)로부터 제어신호를 제공받은 용지올림부(41)는 직선왕복운동이 가능한 실린더부(42)에 의해 구동되는 흡인부(43)를 도면에서의 우측 용지로 이송시킨다. 이송된 흡인부(43)는 상기 용지를 흡인하여 흡착하고, 제어부(50)에 의해 원래위치로 복귀된다. 그러면, 상기 촬상이 완료된 용지는 제본문서(10)의 중앙부와 다음 용지의 활상면 사이에 소정의 공간을 형성시키게 되고, 이와 동시에, 들어올려진 용지를 감지하여 제어부(50)에 신호를 전달하면 넘김바(47)는 제본문서(10)의 중앙부와 다음 용지 활상면 사이의 공간에 위치되어

있다가 구동부(48)의 구동에 의해 일방향으로 주행하는 기어벨트(미도시)에 연동되어 레일봉(46)을 따라 좌측으로 이동하게 된다. 그러면, 들어올려진 용지는 상기 넘김바아(47)에 걸려 좌측으로 넘겨지고, 상기 넘김바아(47)는 원위치로 되돌아간다,

이와 같은 일련의 과정을 반복하여 활상을 수행하게 되고, 제어부(50)가 마지막 용지가 없다는 신호를 전달받아 작업종료 명령이 수렴되면 제본문서(10)는 하우징(11)의 외부로 배출된다.

그러므로 이러한 제본문서 용지 자동넘김장치를 스캐너, 복사기기 등과 같은 화상활상장치에 적용하게 되면, 화상활상이 요구되는 책자 등의 문서를 한 장씩 넘겨가며 활상하지 않아도 되어 이에 수반되는 장점들을 확보할 수 있게 한다.

이상에서의 설명에서와 같이, 본 발명에 따른 제본문서 용지 자동 넘김장치는 스캐너, 복사기기 등을 포함하는 화상활상장치에 적용가능하며, 작업자가 일일이 수작업으로 제본문서를 넘겨가면서 활상을 수행하던 종래와는 달리, 활상작업이 편리해지고, 제본문서를 자동으로 넘기면서 해당면의 활상이 이루어지기 때문에 화상활상에 소요되는 시간을 단축할 수 있는 것은 물론 작업의 정확도와 활상속도가 증가되어 결과적으로는 활상작업 효율의 상승 및 소요인력이 절감되는 점에 그 장점이 있다.

## 특허청구의 범위

1. 용지의 화상정보를 촬상하여 처리하고, 그 처리된 화상정보를 원하는 화상으로 얻는 화상촬상기기에 적용되는 제본문서 용지 자동넘김장치를 구비함에 있어서,

유리판 등의 투명재질로 구성된 투명부재(13)와;

상기 투명부재(13)에 대향되는 방향으로 펼쳐진 제본문서(10)의 제본부를 맞물어 실린더부(21)에 의해 수직승강되며 피봇부재(23)를 중심으로 소정각도 회동가능한 받침부재(22)와, 상기 받침부재(22)의 하단에 설치되어 상기 투명부재(13)로의 압력을 완충하는 탄성편(24)을 구비하는 제본문서 승강수단(20)과;

상기 제본문서(10)의 촬상면이 상기 투명부재(13)에 완전밀착될 수 있게 상기 제본문서(10)의 제본부 양측부를 밀어돌리도록 승강하는 가압편(32)과, 상기 가압편(32)과 동측으로 장착된 탄성편(33) 및 상기 가압편(32)과 탄성편(33)을 승강시키실린더부(31)로 구성된 가압수단(30)과;

촬상이 완료된 용지를 제본문서(10)의 중심방향으로 들어올리도록 설치되는 용지올림부(41)와, 상기 용지올림부(41)에 의해 형성된 공간에서 넘김바아(47)를 좌왕복운동시켜 상기 용지를 넘겨주는 용지넘김부(45)를 포함하는 용지넘김수단(40) 및

상기 제본문서(10)의 승강, 가압 및 용지넘김의 일련과정을 제어하는 제어부(50);를 포함하여 구비되는 것을 특징으로 하는 제본문서 용지 자동넘김장치.

2. 제 1 항에 있어서, 상기 받침부재(22)의 양측에 무게추(25)가 장착되어

있어 상기 받침부재(22)의 회동을 촉진시키는 것을 특징으로 하는 제본문서 용지 자동넘김장치.

3. 제 1 항에 있어서, 상기 용지올림부(41)는 진공력 또는 정전기력에 의해 상기 용지를 흡인하여 들어올리는 흡인부(43) 또는 상기 용지와 외주와의 마찰에 의해 상기 용지를 들어올리는 롤러부 중 어느 하나가 구비되어 있는 것을 특징으로 하는 제본문서 용지 자동넘김장치.

## 요약서

본 발명은 제본문서 용지 자동넘김장치에 관한 것으로 유리판 등의 투명재질로 구성된 투명부재(13)와; 상기 투명부재(13)에 대향되는 방향으로 펼쳐진 제본문서(10)의 제본부를 맞물어 실린더부(21)에 의해 수직승강되며 피봇부재(23)를 중심으로 소정각도 회동가능한 받침부재(22)와, 상기 받침부재(22)의 하단에 설치되어 상기 투명부재(13)로의 가압력을 완충하는 탄성편(24)을 구비하는 제본문서 승강수단(20)과 상기 제본문서(10)의 활상면이 상기 투명부재(13)에 완전밀착될 수 있게 상기 제본문서(10)의 제본부 양측부를 밀어돌리도록 승강하는 가압편(32)과, 상기 가압편(32) 동측으로 장착된 탄성편(33) 및 상기 가압편(32)과 탄성편(33)을 승강시키는 실린더부(31)로 구성된 가압수단(30)과; 활상이 완료된 용지를 제본문서(10)의 중심방향으로 들어올리도록 설치되는 용지올림부(41)와, 상기 용지올림부(41)에 의해 형성된 공간에서 넘김바아(47)를 좌우 왕복운동시켜 상기 용지를 넘겨주는 용지넘김부(45)를 포함하는 용지넘김수단(40); 및 상기 제본문서(10)의 승강, 가압 및 용지넘김의 일련정을 제어하는 제어부(50);를 포함하여 구비되는 제본문서 용지 자동넘김장치를 제공한다.

## AUTOMATIC PAGE TURNING-OVER APPARATUS FOR BOUND PAPERS

### Technical Field

The present invention relates to an automatic page turning-over device, and more particularly to an automatic paper turning-over device adapted to an image scanning device such as a scanner or an auto duplicator and the like, which turns over a sheet of a bound document automatically to scan an image thereof.

### Background Art

Generally, an image scanning device such as a scanner or a auto duplicator and the like comprises an image scanning section for obtaining an image information, a driving section for driving the image scanning section, an image treating section for treating the scanned image information, a control circuit section having a microprocessor for controlling the above sections, and a driving portion for output of the image information.

Such prior image scanning device could scan only to one sheet in such a way that when scanned, the steps of placing a sheet on the glass plate, image scanning the sheet by pressing an image scanning key, and repeating the above steps for a next sheet may be carried out. Also, to image-scan a document which is bound like a book, or has sheets bonded on its one side by a binder, the steps of turning over the one side of the sheet to image scan the same, and turning over again the other side of the sheets to image scan the same should be carried out. Thus, to image scan the document consisting of, for example, more than fifty sheets, more than fifty working steps should be carried out while pressing an image scanning key as well.



Like this, since the prior sheet-turning over device should image scan the document only by a sheet, there is an inconvenience with an image scanning process. Also, the turning over steps should be repeated continuously; thereby causing an operator to feel fatigue, a reduction of operational accuracy and speed, and an eventually reduced working efficiency.

#### Disclosure of the Invention

Therefore, an object of the invention is to resolve the above problem and to provide an automatic paper turning-over device which can be adapted to the image scanning device, and needs not to manually turn over the bound document by a sheet for scanning the same, thereby obtaining the convenient scanning work, and since the bound document is turned over and scanned automatically, a time required for image scanning of the bound document is reduced as well as a working accuracy and a working speed are improved, thus to obtain an efficient scanning and a reduced labor.

To accomplish the object, the present invention provides an automatic paper turning-over device for a bound document adapted to an image scanning device which scans and treats an image information of the sheet, and obtains a desired image from the treated image information, the automatic paper turning-over device comprising a transparent member consisting of a transparent material such as a glass plate; a lifting means for the bound document, having a supporting member, which is rotatable about a pivot member at predetermined angle, for vertically lifting and descending a binding portion of the bound document spread out opposite to the transparent member by a cylinder portion while supporting the binding portion, and an elastic piece mounted on the lower portion of the

supporting member for damping a pressure to the transparent member; a pressing means having a pressing piece for pushing up the opposite sides of the binding portion of the bound document while being lifted and descended so that a scanning face of the bound document may be in closely contact with the transparent member, an elastic piece mounted coaxially with the pressing piece, and a cylinder portion for lifting and descending the pressing piece and the elastic piece; a sheet-turning over means having a sheet-lifting section mounted to lift the scanned out sheet about the bound document, and a sheet-turning over portion for reciprocating a turning over bar in the space defined by the sheet-lifting section to turn over the sheet; and a controller for controlling a series of lifting, pressing and sheet-turning over processes of the bound document.

Preferably, a balance weight is mounted on both sides of the supporting member 22 to promote a rotation of the supporting member.

Preferably, the sheet-lifting section comprises any one of the following portions consisting of a suction portion for sucking the sheet using a vacuum or an electrostatic force, and a roller portion for lifting the sheet using a friction between the sheet and the outer periphery thereof.

In accordance with the above-mentioned construction, there is provided an auto sheet-turning over device which can be adapted to the image scanning device, and needs not to manually turn over the bound document by a sheet for scanning the same, thereby obtaining the convenient scanning work, and since the bound document is turned over and scanned automatically, a time required for image scanning of the bound document is reduced as well as a working accuracy and a working

speed are improved, thus to obtain an efficient scanning and a reduced labor.

#### **Brief Description of the Drawings**

The above object, other features and advantages of the present invention will become more apparent by describing the preferred embodiment thereof with reference to the accompanying drawings, in which:

Fig. 1 is a front view illustrating an automatic paper turning-over device according to an embodiment of the present invention;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a schematic view illustrating an operation of the lifting means of Fig. 1;

Fig. 4 is a schematic view illustrating an operation of the lifting means of Fig. 1;

Fig. 5 is a view illustrating a different operational state of Fig. 3; and

Fig. 6 is a schematic view illustrating an operation of the sheet-turning over means of Fig. 1.

#### **Best Mode for Carrying Out the Invention**

Now, preferred embodiments of the present invention will be described in detail with reference to the annexed drawings.

According to Fig. 1 and Fig. 2, the present invention provides an automatic paper turning-over device that has a configuration including a housing 11 adapted to an image scanning device such as a scanner or a duplicator etc., on which a transparent member 13 such as a glass plate, etc. is provided, and a door portion capable of opening/closing at the front of the housing, which door portion is not described in drawings. In the housing, it is provided a lifting means 20 for bound document 10, pressing means 30, a sheet-turning over means 40, and a controller 50.

That is, the lifting means 20 for bound document is provided for vertically lifting and descending the bound document 10 supported thereon in the opposite direction of the transparent member 13, so that a center portion of a scanning face may be contacted close to the transparent member 13. The pressing means 30 is provided for supporting and pressing both sides of the bound document 10 so that the entire scanning face thereof may be pressed close to the transparent member 13. The sheet-turning over means 40 is provided for turning up the scanned out sheet of the document. Finally, the controller 50 is provided for controlling the driving of the lifting means 20, pressing means 30 and turning over means 40 with signals from a sensor means which is connected to all of the means respectively and is not described in the drawings.

The lifting means 20 comprises a cylinder portion 21 and a supporting member 22 on which a binding portion of the spread bound document 10 is seated, the supporting member being mounted to the top side of a cylinder rod which is driven by the cylinder portion. A pivot member 23 is mounted on a center axis of the supporting member 22 for allowing a body of the supporting member 22 to be pivoted on at predetermined angle thus to support the center portion of the bound document 10 closely to the transparent member 13. Thus, the supporting member 22 can pivot about the pivot member 23 from side to side and push the binding portion to the transparent member 13 even if the bound document is asymmetrical about the binding portion, so that the center portion of the bound document may be in closely contact with the transparent member 13. Under the supporting member 22, the cylinder rod and an elastic piece 24 are provided, which elastic piece is mounted coaxially with the cylinder rod to damp a pressing force

applied to the bound document for closely contacting with the transparent member 13 in order to prevent the transparent member from being damaged. Further, a balance weight 25 is mounted on opposite sides of the supporting member 22. Since the supporting member 22 should be rotated at about 90° to complete a closely contact of the scanning face with the transparent member 13 when a front portion or a back portion of the bound document is in closely contact with the transparent member 13, the balance weight for example serve to promote a rotation of the supporting member in this case.

The pressing means 30 includes a pressing piece 32 for supporting both faces of the bound document 10 while pressing the same so as to bring the scanning face of the bound document into closely contact with the transparent member 13. The pressing piece is supported by the cylinder rod and vertically lifted or descended by the cylinder portion 31. An elastic piece 33 is provided coaxially with the cylinder rod to damp a pressing force applied to the opposite sides of the bound document 10 so that the transparent member 13 may not be damaged while the pressing force of the pressing piece is applied to.

The sheet turning over means 40 includes a sheet-lifting section 41 for lifting the scanned out sheet to turn over the same in the direction A, and a sheet-turning over section 45 for turning over the sheet lifted by the sheet-lifting section 41 and returning to its original position.

The sheet-lifting section 41 capable of linearly reciprocating is mounted. In the preferred embodiment of the present invention, the sheet-lifting section 41 comprises a suction portion 43 for sucking and lifting the sheet by a vacuum force or an electrostatic force,

and a suction generating portion 44 connected to the suction portion 43. However, a friction device such as for example, a roller portion for lifting the sheet by friction force is able to use as the sheet-lifting means of the present invention.

The sheet-turning over section 45 has a turning over bar 47 supported by a rail rod 46 and reciprocated thereto, whose body is supported by a gear belt, which is not described in drawings and driven by a driving section 48, thus to reciprocate with a forward or backward running of the gear belt.

The controller 50 is mounted in such a way that is able to communicate with another external device, thus to control the lifting means 20, pressing means 30 and turning over means 40. That is, the controller 50 controls a driving of the lifting means 20 and the pressing means 30 so as to lift the bound document 10 toward the transparent member 13 thus to bring the bound document into closely contact with the same, and controls the lifting means 20 and the pressing means 30 to be descended by any signals after the scanning face of the sheet is completely scanned out. In the descended state of the bound document 10, the controller 50 controls the turning over means 40 to be driven to turn over the sheet, and thereafter controls again the lifting means 20 and the pressing means 30 to be lifted toward the transparent member 13. The controller 50 controls the lifting means 20 and the pressing means 30 to press the bound document 10 with a proper pressure after receiving a signal for detecting a pressing force applied to the elastic pieces 24 and 33 of the lifting means 20 and the pressing means 30. The controller 50 controls the driving of the lifting means 20 and the pressing means 30 to complete a scanning work and to be descended toward its original position after receiving a

signal that indicates there be no more sheet to be scanned when the scanning work to the bound document 10 is completed.

Now, an operation of the above described automatic paper turning-over device will be explained in detail.

As shown in Fig. 1, the scanning face of the bound document is positioned opposite to the transparent member 13 in a state that the binding portion is seated on the supporting member while the bound document 10 is spread such that the scanning face of the sheet to be initially scanned may be seen. In this case, since the balance weight 20 weighing some weight is mounted on opposite sides of the supporting member 22, even though the first page or the last page of the bound document 10 is scanned, the scanning face will be in closely contact with the transparent member 13 as described in Fig. 1.

In this state, when the scanning device is operates, the controller 50 provides a driving control signal to the lifting means 20. Thereafter, the supporting member 22 is lifted by the driving of the cylinder portion 21 while being supported by the cylinder rod, so that the center portion of the bound document 10 may be in closely contact with the transparent member 13 with a proper pressure. In this case, the elastic piece 24 damps the pressing force of the supporting member generated from a close contact of the bound document 10, so as to prevent the transparent member 13 and the bound document 10 from being damaged by the pressing force of the supporting member. The controller 50 receives a sensing signal indicating the pressing force of the elastic piece 24 and controls the driving of the supporting member 22 in such a way that the supporting member may stop in lifting when the scanning face of the bound document 10 is in closely contact with the transparent member with a predetermined

proper pressure. In this state, the center portion of the bound document 10 is in closely contact with the transparent member 13.

Thereafter, as shown in Fig. 4, the controller 50 provides a driving control signal to the pressing means 30 such that a pressing piece 32 may be lifted by the driving of the cylinder rod of the cylinder portion 31 to support and lift both faces of the bound document 10 dangled outward of the supporting member toward the transparent member 13. Then, the scanning face of the sheet may be in closely contact with the transparent member 13 by a pressing force from the pressing piece 32. Also in this case, the elastic piece 33 mounted coaxially with the pressing piece 32 damps the pressing force of the pressing piece generated from a close contact of both faces of the bound document 10, so as to prevent the transparent member 13 and the bound document 10 from being damaged by the pressing force of the pressing piece 32. The controller 50 receives a sensing signal indicating the pressing force of the elastic piece 33 and controls the driving of the pressing piece 32 in such a way that the pressing piece may stop in lifting when the scanning face of the bound document 10 is in closely contact with the transparent member with a predetermined proper pressure. In this state, both faces of the bound document 10 is in closely contact with the transparent member 13.

Meanwhile, since the binding portion of the bound document 10 is spread out on the supporting member 22 with different thickness during working as shown in Fig. 5, or during initial scanning or final scanning, the binding portion would incline to a thick portion of the document. Simultaneously, the supporting member 22 rotates about the pivot member 23 in the direction a correspondingly to the inclining motion of the binding



portion when the scanning face of the bound document 10 is in closely contact with the transparent member 13, thus to press against the binding portion. Then, the sheet of the bound document 10 is spread out to its center portion to completely closely contact with the transparent member 13. Since the rotation of the supporting member 22 is promoted by the balance weight 25, the bound document 10 keeps in closely contact with the transparent member 13 completely even at its initial portion or final portion.

Thereafter, any image scanning device which is not described in drawings scans the scanning face of the bound document by the control signal, reads and treats the scanning information of the scanned face, and finally obtains a desired image of scanned face.

Then, the controller 50 controls the lifting means to descend the supporting member 22. The controller 50 also descends the pressing piece 32 of the pressing means 30, and when the controller orders a continuous working through a decision whether or not the working ought to be continued, the sheet-turning over means 40 is driven by the control order.

That is, the bound document 10 descended to its original position as shown in Fig. 6, is automatically turned over by the turning over means 40, and the sheet-lifting section 41 received a control signal from the controller 50 carries the suction portion 43 driven by the linearly movable cylinder portion 42 to a right sheet of the drawing. The carried suction portion 43 sucks the sheet and returns to its original position by the controller 50. Then, the scanned out sheet defines a predetermined space between the center portion of the bound document 10 and the scanning face of the next sheet, and at the same time, when the signal for detecting the lifted sheet is transmitted to the

controller 50, the turning over bar 47 is positioned between the center portion of the bound document 10 and the scanning face of the next sheet, and interlocked by one-way gear belt run by the driving portion 48, thus to  
5 move in the left side of the rail rod 46. Then, the lifted sheet is turned over the turning bar 47 in the left side, and the bar returns to its original position.

The scanning is carried out by repeating the those processes, and when the controller 50 receives a signal  
10 for indicating no sheet exists, and orders a discontinuance of working, the bound document 10 is discharged from the housing 11.

Therefore, it is not necessary to scan a document like a book required to be scanned while turning over  
15 the same by a sheet, and many advantages will be obtained correspondingly, when such auto sheet-turning over device is adapted to the image scanning device such as a scanner or a duplicator.

While the present invention has been described  
20 herein with reference to particular embodiments thereof, a latitude of modification, various changes and substitutions are intended in the foregoing disclosure, and in some instances some features of the invention will be employed without a corresponding use of other  
25 features without departing from the scope of the invention as set forth.

#### **Industrial Applicability**

As apparent from the above description, the automatic paper turning-over device of the present  
30 invention can be adapted to the image scanning device such as a scanner or a duplicator. The automatic paper turning-over device of the present invention has many advantages in that an operator needs not to manually turn over the bound document by a sheet for scanning the

same, thereby obtaining the convenient scanning work,  
and since the bound document is turned over and scanned  
automatically, a time required for image scanning of the  
bound document is reduced as well as a working accuracy  
5 and a working speed are improved, thus to obtain an  
efficient scanning and a reduced labor.

### Claims

1. An automatic paper turning-over device for a bound document adapted to an image scanning device which scans and treats an image information of the sheet, and obtains a desired image from the treated image information, the auto sheet-turning over device comprising:

a transparent member 13 consisting of a transparent material such as a glass plate;

a lifting means 20 for the bound document, having a supporting member 22, which is rotatable about a pivot member 23 at predetermined angle, for vertically lifting and descending a binding portion of the bound document spread out opposite to the transparent member 13 by a cylinder portion 21 while supporting the binding portion, and an elastic piece 24 mounted on the lower portion of the supporting member 22 for damping a pressure to the transparent member 13;

a pressing means 30 having a pressing piece 32 for pushing up the opposite sides of the binding portion of the bound document 10 while being lifted and descended so that a scanning face of the bound document may be in closely contact with the transparent member 13, an elastic piece 33 mounted coaxially with the pressing piece 32, and a cylinder portion 31 for lifting and descending the pressing piece 32 and the elastic piece 33;

a sheet-turning over means 40 having a sheet-lifting section 41 mounted to lift the scanned out sheet about the bound document 10, and a sheet-turning over portion 45 for reciprocating a turning over bar 47 in the space defined by the sheet-lifting section 41 to turn over the sheet; and

a controller 50 for controlling a series of lifting, pressing and sheet-turning over processes of the bound document 10.

5 2. The automatic paper turning-over device according to claim 1, wherein a balance weight 25 is mounted on both sides of the supporting member 22 to promote a rotation of the supporting member 22.

10 3. The automatic paper turning-over device according to claim 1, wherein the sheet-lifting section 41 comprises any one of the following portions consisting of a suction portion 43 for sucking the sheet using a vacuum or an electrostatic force, and a roller portion for lifting the sheet using a friction between the sheet and the outer periphery thereof.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR00/00485

**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 B42C 19/00**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC7 B42C 19/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NPS, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 61-93270 U (HOLYZONE-INTERNATIONAL CO.) 16 JUNE 1986 See the whole document	1
A	JP 6-20061 U (POTALS ENG. LTD.) 15 MARCH 1994, page 1, abstract	1, 3
A	US 4569620 A (PERMATEK INC.) 11 FEB. 1986, page 1, abstract	1
A	US 3902210 A (MINNESOTA M&M. CO.) 2 SEPT. 1975, page 1, abstract	1
A	KR 96-520 A (KOREA UNIQUE CO.) 25 JAN. 1996, page 1, abstract	1

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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